

"One result of the present-day rapid development of science is that work is published more hastily, and many unstable intermediate steps which, under the old system of slower production, disappeared after they had served their turn, now enjoy their brief existence in the literature under all eyes. The unfortunate thing is that no formal notice is given of their decease."

It only remains to be said that the translator has performed his part of the work very well.

(2) Of the many services for which the science of chemistry is indebted to Prof. Ostwald, not the least is the writing of the "Grundlinien der anorganischen Chemie," the third German edition of which (completing an issue of ten thousand copies) has recently appeared. To English-reading students of chemistry the book is already well known under the title "Principles of Inorganic Chemistry," which is also in its third edition, so that it is unnecessary to say anything with regard to the general purpose and scope of the work. The continued demand for the "Grundlinien," however, and the publication of a number of other text-books modelled largely on that of Ostwald, afford a clear indication of the nature of the revolution which has taken place during the present century in the methods of teaching inorganic chemistry.

While the general character of the book remains unchanged, the author has not wearied in effecting a revision and rearrangement of the text and in making such additions as were necessary to make the method of treatment more logical in its development and to bring the subject-matter into line with the present-day position of knowledge. Having become convinced that a description of the properties and formation of the three states of matter, independently of the chemical differences in the narrower sense, should precede the usual description of the preparation and properties of the individual substances, the author has inserted into the earlier portion of the book two chapters on the transformation of physical states and on solutions, in which the fundamental characteristics of equilibria between phases and of solutions are treated. Through this rearrangement of the matter, the book has been considerably improved.

Of the additions which have been made, the most notable is the chapter on the radio-active elements. In this chapter an excellent account of the phenomena of radio-activity and the radio-active characters of radium, uranium, thorium, and actinium is given. One can only regret that this chapter was not worked into the section on the same subject in the English edition of the author's "Outlines of General Chemistry."

A. F.

HEALTH HANDBOOKS.

- (1) *Rural Hygiene*. By Prof. H. N. Ogden. Pp. xvii+434. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1911.) Price 6s. 6d. net.
- (2) *The Fasting Cure*. By Upton Sinclair. Pp. 261. (London: W. Heinemann, 1911.) Price 2s. 6d. net.
- (3) *Exercising in Bed: the Story of an Old Body and Face made Young. The Simplest and most Effective System of Exercise ever Devised*. By Sanford Bennett. Second edition. Pp. xi+262+xii-lxiii+263-268. (New York: The Physical Culture Publishing Co., n.d.)

(1) **T**HIS book, though written by an engineer and therefore dealing more particularly with the constructional side of hygiene, contains a considerable amount of epidemiological data, and forms a complete simple treatise on the subject of which it treats. Rural hygiene is of much importance, and many problems present themselves for solution which do not arise in towns and cities. Although dealing with American practice, it is quite applicable in this country, and includes details somewhat novel to us. Thus for waterproofing cellars, it is suggested that the wall may be built in two layers with a half-inch interspace which is filled with asphalt, or that the outside of the wall may be painted with hot tar into which several layers of tar-paper are pressed, the several sheets overlapping in a special coating of tar. A simple test is given for ascertaining the amount of sand in gravel used for making concrete, by which the proper proportion of sand may be arrived at. While giving current views on a subject, the author does not hesitate to state facts which are not altogether in agreement with them, *e.g.* as regard the unhealthiness of made soil (p. 37). Altogether the book is one which may be read with pleasure and profit.

(2) Mr. Sinclair's book is somewhat diffuse, but apparently the underlying idea is that a *régime* consisting of alternate periods of fasting and of special diet is the secret of ideal health. Inasmuch as those of us who can afford to do so probably habitually overfeed rather than underfeed, and that Chittenden and his co-workers have shown that perfect health may be sustained on half the protein usually considered necessary, there may be a good deal in the author's views. Ordinarily the fasts may be of four to six days' duration, abundance of water being taken during this period; the fast is cautiously broken, and then the diet consists of abundance of milk, or of lean beef-steak with water (*i.e.* the Salisbury treatment). It is well known, of course, that milk, owing to the peculiar chemical composition of its

proteins, does not give rise to putrefactive products which are the basis of auto-intoxication, so that the diet in this sense is an ideal one. It is interesting to note that the author has tried again and again a strictly vegetarian diet, but does not find it so satisfactory as those mentioned. Making allowance for the author's enthusiasm and special pleading, we may conclude that there is "something in it."

(3) The first edition of this book was noticed in *NATURE* of January 21, 1909. The author, by adopting a series of exercises carried out in bed, claims that he became a rejuvenated individual. As we said regarding the first edition, we think that the author has devised a system of physical exercises which, if carried out, would be of considerable benefit to those who, either from necessity or inclination, lead a sedentary life.

R. T. HEWLETT.

OUR BOOKSHELF.

Lectures delivered at the Celebration of the Twentieth Anniversary of the Foundation of Clark University, under the auspices of the Department of Physics. By Vito Volterra, Ernest Rutherford, Robert Wm. Wood, and Carl Barus. Worcester, Mass., September 7-11, 1909. Pp. vii+161. (Published by Clark University; New York and London: G. E. Stechert and Co., 1912.) Price 10s. net.

THE system of holding conferences at which a number of lectures are given by eminent specialists is a noticeable feature of American universities, and is being adopted with success in other countries. Clark University was founded in 1889, and under the invitation of its Department of Physics courses of lectures were given to celebrate its twentieth anniversary. Those published in this volume are by Prof. Vito Volterra on recent progress in mathematical physics (in French), by Prof. Rutherford on the history of the alpha rays, by Prof. R. W. Wood on optical properties of metallic vapours, and by Prof. C. Barus on physical properties of iron carbides. Other lectures by Profs. Michelson and E. F. Nichols are not published. The volume will be of interest to those who attended the conferences or who desire a not too extensive summary of our knowledge in the branches of study covered by the lectures.

Magnetochemie. Beziehungen zwischen magnetischen Eigenschaften und chemischer Natur. By Prof. E. Wedekind. Pp. viii+114. (Berlin: Gebrüder Borntraeger, 1911.) Price 3 marks.

THE subject of this monograph is one which has attracted considerable attention within recent years. It is, as the title implies, the study of the relation between magnetic quality and chemical composition. The author begins with a short sketch of the methods of magnetic measurement, which is useful and no doubt sufficient for his purpose, although it is not free from blemishes

which one might desire to see removed. For instance, the diagrams on pp. 7 and 10 are extremely rough, and even misleading. Then follows an account of the ferromagnetic substances, and after this the magnetism of dissolved salts is described. Paramagnetism and diamagnetism are then dealt with, and the book concludes with a sketch of the "magneton" theory.

The descriptive parts are good and extremely useful as a record of modern work and progress; but the book is essentially qualitative in character and contains little in the way of exact analysis of the results which have been obtained. The work will be valued by those engaged in research upon the subject, and also by those wishing to obtain some general acquaintance with it. We have, unfortunately, too few books of this character in our own language.

The Teachers' Book of Constructive Work for Elementary Schools. By Ed. J. S. Lay. Pp. xii+142. (London: Macmillan and Co., Ltd., 1912.) Price 3s. 6d. net.

EACH year now sees more attention given to school exercises in the various subjects of the curriculum which demand the employment of the hands as well as the brains of the children. Teachers of experience understand that young pupils learn best by doing, and this view gains ground everywhere. Mr. Lay in this book describes for the benefit of other teachers how he has succeeded in giving reality to lessons in arithmetic, history, geography, and so on, by constructive work of an interesting kind, so graduated that the method may be employed with children from five to fourteen years of age. The book may be commended to the notice of schoolmasters and schoolmistresses as an example of what can be done with very little expenditure to make elementary education less bookish and unreal.

LETTERS TO THE EDITOR.

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Forced Vibrations.

IN his letter on the above subject in *NATURE* of June 27, Prof. Perry examines some typical dynamical and electrical solutions of the equation

$$(D^2 + 2kD + n^2)x = A \cos pt \quad \dots (1)$$

with special reference to the critical case of maximum amplitude of the forced vibration; he shows that in all the cases examined the critical value of p which excites maximum response is either n or $\sqrt{n^2 - 2k^2}$, while the frequency of the free damped vibration is given by $\sqrt{n^2 - k^2}$, and concludes that the usual statement is not correct that for maximum response "the forcing influence ought to be in tune with the natural frequency of the system." But is it usual to define the natural frequency of the system as $\sqrt{n^2 - k^2}$? The term is ordinarily employed, like the